

# ABSTRACT OF THE DISCLOSURE

A network device dynamically switches between layer 2 (data link) operation and layer 3 (network) operation. When enabled, bridging logic functions as a data link bridge, receiving data link messages from communications links forming part of a single network-layer segment and forwarding the messages to another communications link using layer-2 addresses in the messages. When enabled, routing logic functions as a network router, receiving network layer messages from different network-layer segments and forwarding the messages to other links based on a routing algorithm and the network layer addresses. Selection logic dynamically selects the desired function under different operating conditions. For a transition from router to bridge, multiple network-layer segments are merged into a single bridged network-layer segment, freeing up link numbers for use in configuring addresses for other segments. For the transition from bridge to router, a single bridged network-layer segment is divided into multiple segments having distinct routing identities.

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